



Model 650 FID Analyzer

Continuous monitoring of total volatile hydrocarbons in industrial processes

Flame Ionization Detector

The Model 650 FID is a high-temperature flame ionization sensor that continuously measures total hydrocarbon concentrations. Control Instruments' proprietary FID design assures an accurate and linear response.

A carefully metered pilot flame incinerates the sample. The resulting ionized carbon passes through an electrical field, creating a proportional current flow. An electrometer measures the current flow. The resulting electrometer output is amplified and displayed as either: parts per million of a hydrocarbon (PPM); Milligrams of Carbon per Cubic Meter (mgC/m³); or PPM of Carbon by Volume (PPMCv).

Heated Sampling System

To avoid condensation during sampling, the entire sensor pneumatic assembly is heated up to 200°C. This eliminates both inaccurate readings caused by solvent dropout as well as excessive maintenance time due to sample condensation and clogging.

The Model 650 is suitable for monitoring high flash point solvent vapors and other compounds with high temperature dew points. The sensor is unaffected by the temperature of the process and can sample streams at 700°C (and higher).

The analyzer can be mounted directly onto the process ductwork, as close as possible to the sample pickup point. This eliminates external heated sample lines and allows the fastest response time.



The analyzer employs customer-supplied compressed air to drive its integrated air-aspirated sampling system. This method is simple, highly effective and requires very little maintenance. The sampling system does not require bottled air or sample pumps.

Failsafe Operation

A fault relay de-energizes whenever any of the following occur: sensor electrical failure; loss of system power; loss of heat; loss of flow

through the flame cell; and downscale readings caused by loss of flame or fuel.

Performance

Detector response time is 1.2 seconds. The sensor exhibits a very stable zero: less than one percent drift in thirty days. Calibration accuracy has less than five percent error per year.

The device is an industrial strength assembly suitable for continuous use in harsh environments; the optional corrosion-resistant IP 65, NEMA 4X housing is suitable for direct mounting on the process indoors or out.

Outputs

The Model 650 has three (3) single-pole, double-throw relays for Warning, Danger, Malfunction, and three (3) single-pole, single-throw relays for Horn, Calibration-in-Progress and Service Needed. Other standard outputs include a 4-20mA analog output and an RS-485 serial port with Modbus protocol.

Specifications	
Part Number	SNR650
Calibration	PPM (Part Per Million Hydrocarbon) PPMCv (PPM Carbon by Volume) mgC/m ³ (milligrams carbon per cubic meter at 20°C)
Minimum Range	33ppm as Propane (100 PPMCv, 50 mgC/m ³)
Maximum Range	20.000ppm as Propane (60.000 PPMCv)
Linearity	± 1% fullscale
Repeatability	± 1% fullscale
Zero stability	± 1% in 30 days
Span stability	± 5% per year
Cell Response Time	T _{63.2} = 1,2 seconds
Operating Temp.	Sensor sample train heated up to 200°C
Power requirement	120 VAC +10%-15% 50/60 Hertz or 230 VAC +10%-15% 50/60 Hertz Max. 400 Watt, typical 200 Watt
Fuel requirements	Pure Hydrogen, min. 99,999%, less than 1 ppmCv hydrocarbons) Inlet pressure 2,8-3,1 barg Consumption: typical 40 Nm ³ /min,
Compressed air	Clean, dry instrument air Inlet pressure 1,4 barg Consumption: typical 30 Nm ³ /min
Humidity range	0-100% RF, non-condensing
Ambient temperature	-40°C to +65°C
Relays	60 Watts contacts
Relay functions	Six relays for: warning, danger, fault, horn, calibration-in-progress
Alarm function	Two adjustable alarm levels
Analog output	4-20mA, non-isolated, 275 Ohms max. including line length. Resolution 0.6% fullscale
Serial interface	RS-485, two-wire, half-duplex, Modbus protocol. Resolution 0.03% fullscale
Flame Cell Material	Hard-coat aluminum
Sample train material	Hard-coat aluminum, stainless steel, Viton
Enclosure rating	NEMA 12/13 (IP 54) Indoor (NEMA 4X/IP 65 corrosion-resistant, outdoor optional)
Dimensions	406mm H x 307mm B x 216mm T
Weight	approx. 18 kg